

CLAIMS

What is claimed is:

1. A test strip for measuring glucose in a blood sample, said test strip comprising:

5 a base layer, said base layer sheet having a proximal end and a distal end, said proximal end being narrower than said distal end;

at least four electrodes disposed on said base layer, said at least four electrodes including a working electrode, a counter electrode, a fill-detect anode, and a fill-detect cathode;

10 a plurality of electrical contacts disposed on said base layer, said plurality of electrical contacts including a working electrode contact, a counter electrode contact, a fill-detect anode contact, and a fill-detect cathode contact;

15 a plurality of conductive traces disposed on said base layer, said plurality of conductive traces electrically connecting said working electrode to said working electrode contact, said counter electrode to said counter electrode contact, said fill-detect anode to said fill-detect anode contact, said fill-detect cathode to said fill-detect cathode contact;

an auto-on conductor disposed on said base layer;

a first dielectric layer disposed on said base layer, said first dielectric layer covering portions of said working electrode and said counter electrode, so as to define an exposed working electrode portion and an exposed counter electrode portion;

20 a second dielectric layer disposed on said base layer, said second dielectric layer having a slot, said working electrode, said counter electrode, said fill-detect anode, and said fill-detect

cathode being disposed in said slot, said slot having a proximal end and a distal end, said proximal end of said slot being aligned with said proximal end of said base layer;

a reagent layer disposed in said slot, said reagent layer including glucose oxidase and a mediator; and

5 a porous cover disposed on said second dielectric layer,

wherein said slot defines a testing zone for testing said blood sample, said slot being dimensioned to draw said blood sample in through said proximal end of said slot by capillary action.

10 2. The test strip of claim 1, wherein said porous cover comprises a mesh.

3. The test strip of claim 1, wherein said porous cover comprises a perforated sheet.

15 4. The test strip of claim 1, wherein said counter electrode includes a first section and a second section, said working electrode being disposed on said base layer between said first section and said second section.

5. The test strip of claim 1, wherein said at least four electrodes are formed by a first conductive ink printed on said base layer.

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6. The test strip of claim 5, wherein said first conductive ink contains graphite.

7. The test strip of claim 6, wherein said electrical contacts, said conductive traces, and said auto-on conductor are formed by a second conductive ink printed on said base layer.

8. The test strip of claim 7, wherein said second conductive ink contains silver.

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9. The test strip of claim 1, wherein said test strip has a thick section and a thin section, said thick section including said proximal end, said thin section including said distal end, said electrical contacts and said auto-on conductor being located in said thin section.

10 10. The test strip of claim 1, wherein said reagent layer covers said exposed working electrode portion.

11. A test strip for testing a blood sample, said test strip comprising:

a first substrate;

15 a second substrate, said second substrate defining a testing zone for testing said blood sample;

at least four electrodes, disposed on said first substrate, for measuring at least one electrical characteristic of said blood sample in said testing zone, said at least four electrodes including a working electrode, a counter electrode, a fill-detect anode, and a fill-detect cathode;

20 a plurality of electrical contacts disposed on said first substrate and electrically connected to said at least four electrodes; and

at least one auto-on electrical contact disposed on said first substrate and electrically isolated from said at least four electrodes.

12. The test strip of claim 11, further comprising:

5 a reagent layer disposed in said testing zone.

13. The test strip of claim 11, further comprising:

a cover disposed over said testing zone.

10 14. The test strip of claim 13, wherein said cover is a porous cover.

15. The test strip of claim 14, wherein said porous cover comprises a mesh.

16. The test strip of claim 14, wherein said porous cover comprises a perforated sheet.

15 17. The test strip of claim 11, wherein said test strip has a proximal end and a distal end, wherein said second substrate defines an opening at said proximal end for receiving said blood sample.

20 18. The test strip of claim 17, wherein said proximal end is narrower than said distal end.

19. The test strip of claim 17, wherein said test strip has a thick section and a thin section, said thick section including said proximal end, said thin section including said distal end.

20. The test strip of claim 19, wherein said plurality of electrical contacts and said at least one auto-on electrical contact are located in said thin section.

21. A method of making a plurality of test strips, said method comprising:
forming a plurality of test strip structures on an insulating sheet, wherein each test strip structure is formed by:

(a) forming a first conductive pattern on said insulating sheet, said first conductive pattern including at least four electrodes, said at least four electrodes including a working electrode, a counter electrode, a fill-detect anode, and a fill-detect cathode;

(b) forming a second conductive pattern on said insulating sheet, said second conductive pattern including a plurality of electrode contacts for said at least four electrodes, a plurality of conductive traces electrically connecting said at least four electrodes to said plurality of electrode contacts, and an auto-on conductor;

(c) applying a first dielectric layer over portions of said working electrode and said counter electrode, so as to define an exposed working electrode portion and an exposed counter electrode portion;

(d) applying a second dielectric layer to said first dielectric layer, said second dielectric layer defining a slot, said working electrode, said counter electrode, said fill-detect anode, and said fill-detect cathode being disposed in said slot;

(e) forming a reagent layer in said slot, said reagent layer including glucose oxidase and a mediator; and

(f) attaching a porous cover to said second dielectric layer; and
separating said plurality of test strip structures into said plurality of test strips, each of
5 said test strips having a proximal end and a distal end, with said slot extending to said proximal
end, said proximal end being narrower than said distal end.

22. The method of claim 21, wherein said porous cover comprises a mesh.

10 23. The method of claim 21, wherein said porous cover comprises a perforated sheet.

24. The method of claim 21, wherein forming a first conductive pattern on said
insulating sheet comprises:

printing a first conductive ink on said insulating sheet, said first conductive ink
15 containing graphite.

25. The method of claim 24, wherein forming a second conductive pattern on said
insulating sheet comprises:

printing a second conductive ink on said insulating sheet, said second conductive ink
20 containing silver.

26. A method of making a plurality of test strips, said method comprising:

forming a plurality of test strip structures on one sheet, each of said test strip structures including:

(a) a spacer defining a testing zone;

(b) a plurality of electrodes formed on said sheet, including a working electrode, a counter electrode, a fill-detect anode, and a fill-detect cathode;

(c) a plurality of electrical contacts, formed on said sheet and electrically connected to said plurality of electrodes; and

(d) at least one auto-on electrical contact, formed on said sheet and electrically isolated from said plurality of electrodes; and

separating said test strip structures into said plurality of test strips.

27. The method of claim 26, wherein each of said test strip structures further comprises:

a cover disposed over said testing zone.

28. The method of claim 26, wherein said cover is a porous cover.

29. The method of claim 28, wherein said porous cover comprises a mesh.

30. The method of claim 28, wherein said porous cover comprises a perforated sheet.

31. The method of claim 26, wherein each of said test strip structures includes a reagent layer disposed in said testing zone.

32. The method of claim 26, wherein separating said test strip structures into said
5 plurality of test strips comprises:

punching said plurality of test strip structures to form a plurality of tapered test strip structures, each of said tapered test strip structures having a tapered section.

33. The method of claim 30, wherein separating said test strip structures into said
10 plurality of test strips further comprises:

slitting said plurality of tapered test strip structures into said plurality of test strips.